

Please amend the claims as follows:

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1. (Amended) An apparatus for applying components of one or more source materials to [spatially addressable,] predefined regions on [locations onto] a substrate, the apparatus comprising:
[at least one] one or more source materials, wherein the source materials are inorganic compounds or electro-polymerizable monomers; and
a potential assembly for applying a spatially varying electrical potential across the [said] substrate, the [said] spatially varying electrical potential causing the components of the [said] source materials to undergo chemical reaction at the predefined regions and thereby to deposit at the [said spatially addressable,] predefined regions [locations], wherein the components of at least two of the predefined regions are different.

5. (Amended) The apparatus of claim 1 [2], wherein the potential assembly comprises a power source and an array of spatially addressable working electrodes coupled to or embedded within the [said] substrate, the [said] working electrodes being coupled to the [said] power source such that a different electrical potential may be applied to each of the [said] working electrodes.

6. (Amended) The apparatus of claim 5, further comprising a reference electrode coupled to the [said] power source.

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7. (Amended) The apparatus of claim 5, further comprising a plurality of reference electrodes coupled to the [said] power source, wherein each of the [said] reference electrodes is located adjacent [to] each of the [said] spatially addressable working electrodes.

8. (Amended) The apparatus of claim 5, wherein each of the [said spatially addressable,] predefined regions [locations] is defined by each of the [said] working electrodes.

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9. (Amended) The apparatus of claim 2, further comprising an ionic solution in contact with the [said] substrate.

10. (Amended) The apparatus of claim 1, wherein the [said] substrate is formed from a material selected from the group consisting of polymers, plastics, borosilicate glass [pyrex], quartz, [resins,] silicon, and silica-based materials.

11. (Amended) The apparatus of claim 5, wherein the [said] substrate comprises silicon dioxide and the [said] spatially addressable working electrodes are metal electrodes.

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12. (Amended) The apparatus of claim 1, further comprising an enclosure housing the [said] substrate therein, wherein the [said] substrate is immersed in a bath of the [said] source material.

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13. (Amended) The apparatus of claim 12, wherein the [said] bath further comprises a solution of ions.

14. (Amended) The apparatus of claim 1 [2], wherein the [said] potential assembly comprises a working electrode and a reference electrode, wherein the [said] electrical potential of the [said] working electrode varies substantially continuously across a surface of the [said] working electrode.

15. (Amended) The apparatus of claim 14, wherein the [said] substrate is a resistive material.

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23. (Amended) The apparatus of claim 1, wherein the [said] potential assembly is configured to apply the [said] components of the [said] source materials onto the [said] substrate in patterns[, said patterns allowing comparison of] for comparing specific material

characteristics of the [said] materials deposited at the [said spatially addressable,] predefined regions [locations].

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24. (Amended) The apparatus of claim 1, wherein the [said] potential assembly is adapted to deposit [capable of depositing] at least nine [9] different materials to at least nine [9] different locations of the [said spatially addressable,] predefined regions [locations].

25. (Amended) The apparatus of claim 1, wherein the [said] substrate comprises at least one [1 spatially addressable,] predefined region [location] per square centimeter.

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39. (Amended) An apparatus for screening a plurality of materials for an electrical property [a specific material characteristic], the apparatus comprising:
an array, wherein the [said] plurality of materials correspond to a plurality of predefined regions on the [locations on said] array and the plurality of materials are inorganic compounds or polymers;

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a plurality of electrodes, wherein the [said] plurality of electrodes correspond to the [said] plurality of predefined regions [locations]; and

a detector coupled to the [means associated with said] plurality of electrodes for measuring the electrical property of [testing] each of the [said] plurality of materials [for said specific material characteristic].

40. (Amended) The apparatus of claim 39, wherein the electrical property is [said specific material characteristic is an] AC impedance.

Please add the following new claims:

41. (New) The apparatus of claim 1, wherein the source materials are dissolved in a solvent.

42. (New) The apparatus of claim 1, wherein the spatially varying electrical potential causes the components of the source material to undergo redox reaction at the predefined regions and thereby to deposit at the predefined regions.

43. (New) An apparatus for making an array of materials by electrochemical deposition, the array of materials having a plurality of members, the apparatus comprising:
a substrate having predefined regions for receiving the members of the array of materials;
spatially addressable electrodes located adjacent the predefined regions, the spatially addressable electrodes electrically connected to the predefined regions; and
at least one other electrode, the at least one other electrode and the spatially addressable electrodes adapted to apply an independently variable electrical potential between each of the predefined regions and the at least one other electrode so that when the substrate contacts a solution containing ions, the ions undergo chemical reaction at the predefined regions forming the array of materials in which at least two members of the array of materials are different.

44. (New) The apparatus of claim 43, wherein the spatially addressable electrodes are embedded within the substrate.

45. (New) The apparatus of claim 43, wherein the ends of the spatially addressable electrodes are disposed on a surface of the substrate.

46. (New) The apparatus of claim 43, wherein the substrate is a resistive material that provides a substantially continuous electrical potential between adjacent predefined regions.

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47. (New) The apparatus of claim 43, further comprising reference electrodes having ends located adjacent the ends of the spatially addressable electrodes; wherein the spatially addressable electrodes, the at least one other electrode and the reference electrodes are adapted to apply the independently variable electrical potential between each of the predefined regions and the at least one other electrode.

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548. (New) The apparatus of claim 43, wherein the predefined regions are wells formed on a surface of the substrate.

649. (New) The apparatus of claim 43, wherein the predefined regions are bumps formed on a surface of the substrate.

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50. (New) The apparatus of claim 43, wherein the ions undergo redox reaction at the predefined regions forming the array of materials in which at least two members of the array of materials are different.

51. (New) An apparatus for making an array of materials by electrochemical deposition, the array of materials having a plurality of members, the apparatus comprising:

- a first chamber having an inlet for supplying a first ionic solution to the first chamber and an outlet for removing the first ionic solution from the first chamber;
- a second chamber having an inlet for supplying a second ionic solution to the second chamber and an outlet for removing the second ionic solution from the second chamber;
- a permeable membrane separating the first chamber from the second chamber, the permeable membrane allowing ions to migrate between the first chamber and the second chamber;
- a substrate located in the first chamber, the substrate having predefined regions for receiving members of the array of materials;
- working electrodes having ends located adjacent the predefined regions, the ends of the working electrodes electrically connected to the predefined regions;
- reference electrodes having ends located adjacent the ends of the working electrodes;
- and
- a counter electrode located in the second chamber;

wherein the working electrodes, the reference electrodes and the counter electrode are adapted to apply an independently variable electrical potential between each of the predefined regions and the counter electrode so that ions undergo chemical reaction at the predefined regions of the substrate to form the array of materials in which at least two members of the array of materials are different.

9 52. (New) The apparatus of claim 51, wherein the working electrodes are embedded within the substrate.

10 53. (New) The apparatus of claim 51, wherein the ends of the working electrodes are disposed on a surface of the substrate.

11 54. (New) The apparatus of claim ⁸51, wherein the substrate is a resistive material adapted to provide a substantially continuous electrical potential between adjacent predefined regions.

12 55. (New) The apparatus of claim ⁸51, wherein the predefined regions are wells formed on a surface of the substrate.

13 56. (New) The apparatus of claim ⁸51, wherein the predefined regions are bumps formed on a surface of the substrate.

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57. (New) The apparatus of claim 51, wherein the ions undergo redox reaction at the predefined regions of the substrate to form the array of materials in which at least two members of the array of materials are different.

58. (New) A material testing array comprising:
materials for testing, wherein at least two of the materials are different;
a substrate having predefined regions for containing the materials, the materials separately disposed on the predefined regions; and
spatially addressable electrodes located adjacent the predefined regions, each of the spatially addressable electrodes electrically connected to each of the materials.

59. (New) The material testing array of claim 58, wherein at least three of the materials are different.

60. (New) The material testing array of claim 58, wherein the materials are inorganic compounds or polymers.

61. (New) The material testing array of claim 58, wherein the materials are inorganic compounds.